Please cancel claim 1. Please add new claims 2-96.

1   1.   (Cancelled).

1   2.   (New) A system for encoding one or more repetitive data blocks in data

2   communicated over a network comprising:

3   an encoder module, coupled in the network, the encoder module intercepting the data, the

4   encoder module extracting data blocks from different communication sessions from

5   the intercepted data, each extracted block having a destination address supported for

6   decoding by at least one corresponding decoder module, and the encoder module

7   passing through data not having a supported destination address; and

8   a memory, accessible to the encoder module, for storing the contents of one or more data

9   blocks previously transmitted by the encoder module wherein the encoder module

10   determines whether there is a match between the contents of each of the extracted

11   data blocks and the contents of at least one previously transmitted data block,

12   wherein responsive to said match, the encoder module encodes the respective extracted

13   data block and transmits the respective extracted data block in encoded form to the at

14   least one corresponding decoder module, and responsive to no match, the encoder

15   module transmits the respective extracted data block in intercepted form to the at least

16   one corresponding decoder module.

1   3. (New) The system of claim 2 wherein the encoded form of the respective extracted

2   data block is transparent to one or more nodes in the network.

1   4. (New) The system of claim 2 wherein the encoder module is coupled via a switch in a

2   physical connection between two nodes of the network, responsive to a first configuration of the

3   switch, the encoder module processing data that traverse the physical connection between these

4   two nodes, and responsive to a second configuration of the switch, the data bypassing the

5   encoder module.

1   5. (New) The system of claim 2 wherein the encoder module operates in a node in the

2   network and decides a route for the respective extracted data block to the at least one

3   corresponding decoder module supporting its destination address.

1   6. (New) The system of claim 2 wherein the encoder module, responsive to a match in

2   contents, transmits an indicator, identifying that the contents of a respective data block have been

3   previously transmitted.

1   7. (New) The system of claim 6 wherein the indicator is a special symbol.

1   8. (New) The system of claim 6 wherein the indicator is an extra header.

1   9. (New) The system of claim 2 wherein at least one respective data block is a packet

2   payload.

1   10. (New) The system of claim 2 wherein at least one respective data block is a portion

2   of a packet payload.

1   11. (New) The system of claim 2 wherein the encoder module encodes at least one

2   extracted data block using a synchronization mechanism for verifying the identification of the

3   one or more previously transmitted data blocks with the at least one corresponding decoder

4   module supporting the destination address of the extracted data block.

1   12. (New) The system of claim 11 wherein the synchronization mechanism is an explicit

2   synchronization mechanism.

1   13. (New) The system of claim 11 wherein the synchronization mechanism is an

2   implicit synchronization mechanism.

1   14. (New) The system of claim 11 wherein the implicit synchronization mechanism is a

2   reliable network transport protocol.

1   15. (New) The system of claim 2 further comprising the encoder module, responsive to

2   no match between the contents of the respective extracted data block and the contents of at least

3   one of the previously transmitted blocks, determining whether to delete at least one of the

4   previously transmitted data blocks in the memory, and storing the respective extracted data block

5   in intercepted form in the memory.

1   16. (New) The system of claim 2 wherein the memory comprises a least recently used

2   data structure for storing one or more previously transmitted unique data blocks, said least

3   recently used data structure having a maximum capacity and each of the previously transmitted

4   unique data blocks having a unique identifier and a position in an order of most recently used to

5   least recently used of the one or more stored blocks.

1   17. (New) The system of claim 16 wherein the encoder module, responsive to a match

2   in contents, associates the previously transmitted data block having the matching contents with

3   the position in the least recently used data structure indicating the most recently used previously

4   transmitted data block.

1   18. (New) The system of claim 16 wherein the encoder module, responsive to no match

2   between the contents of an extracted data block and the contents of one of the previously

3   transmitted data blocks, storing the extracted data block in the least recently used data structure,

4   and associating the position of most recently used with the extracted data block.

1   19. (New) The system of claim 18 wherein the encoder module, responsive to no match

2   between the contents of an extracted data block and the contents of one of the previously

3   transmitted data blocks, storing the extracted data block in the least recently used data structure,

4   and associating the position of most recently used with the extracted data block further

5   comprising:

6   responsive to the least recently used data structure being at the maximum capacity,

7   deleting the previously transmitted data block having the order position of least

8   recently used data block.

1   20. (New) The system of claim 19 further comprising a synchronization mechanism

2   including a same size for the least recently used data structure as the size of a second least

3   recently used data structure accessible by the corresponding decoder module receiving the

4   respective extracted data block, and a reliable network transport protocol being used for the

5   transmission of the respective extracted data block.

1   21. (New) The system of claim 19 further comprising a synchronization mechanism

2   including an indicator for each transmitted extracted data block indicating whether the data block

3   has been associated with the least recently used data structure and an installed flag associated

4   with each of the previously transmitted data blocks in the least recently used data structure, the

5   installed flag indicating whether the associated data block has been stored in a second least

6   recently used data structure accessible by the corresponding decoder module that has received

7   the respective extracted data block.

1   22. (New) The system of claim 21 wherein the installed flag is updated after a fixed

2   amount of time after transmission of the data block.

1   23. (New) The system of claim 21 wherein the installed flag is updated responsive to a

2   notification from the corresponding decoder module that the associated data block has been

3   stored in the second least recently used data structure.

1   24. (New) The system of claim 2 wherein the memory stores a data structure for

2 associating a signature with one or more of the previously transmitted data blocks, and wherein

3 the encoder module computes a signature for the respective extracted data block, compares the

4 computed signature with at least one signature associated with the one or more previously

5 transmitted data blocks, and responsive to a match in signature, selecting the one or more

6 previously transmitted data blocks having the match in signature for content comparison with the

7 respective extracted data block.

1   25. (New) The system of claim 24 wherein the data structure for associating a signature

2 with one or more of the previously transmitted data blocks is a hash table having one or more

3 bins.

1   26. (New) The system of claim 25 wherein the computed signature value is less than the

2 number of hash table bins.

1   27. (New) The system of claim 25 wherein the computed signature value is computed

2 modulo the number of bins.

1   28. (New) The system of claim 2 further comprising an encapsulation module for

2 encapsulating the extracted data blocks for transport over the network.

1   29. (New) The system of claim 28 wherein at least one of the extracted data blocks is

2 included in a packet, and the packet is encapsulated as one packet.

1   30. (New) The system of claim 28 wherein at least one of the extracted data blocks is

2 included in a packet and the packet is encapsulated with at least one other packet in an outgoing

3 packet for transmission.

1   31. (New) The system of claim 28 wherein the encapsulation of at least one of the

2 extracted data blocks is transparent to one or more nodes in the network.

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1 32. (New) The system of claim 28 wherein the encapsulation module comprises a timer

2 mechanism for ensuring that the at least one extracted data block is held in a buffer coupled to

3 the encapsulation module for no more than a pre-determined maximum time before being

4 transmitted.

1 33. (New) The system of claim 30 wherein the encapsulation module comprises a timer

2 mechanism for ensuring that the at least one extracted data block is held in a buffer coupled to

3 the encapsulation module for no more than a pre-determined maximum time before being

4 transmitted.

1 34. (New) The system of claim 28 wherein the encoder module encodes at least one data

2 block at a first layer of a model describing the flow of data across a network and the

3 encapsulation module encapsulates the at least one extracted data block at a second layer of the

4 model.

1 35. (New) The system of claim 34 wherein the first and second layers are at the same

2 layer of the model.

1 36. (New) The system of claim 35 wherein one of the layers is a connection-oriented

2 layer and the other layer is a connectionless layer.

1 37. (New) The system of claim 2 wherein the encoder module receives routing

2 information over the network from each of one or more corresponding decoder modules with

3 which it communicates and determines the one or more addresses supported by each respective

4 decoder module from the routing information.

1 38. (New) The system of claim 37 wherein the encoder module determines network

2 topology information based upon the routing information from the one or more decoder modules.

1   39. (New) The system of claim 38 wherein, responsive to multiple decoder modules in

2   the network supporting the same address, the encoder module determines a destination decoder

3   module for one or more extracted data blocks based upon network topology information and

4   routing criteria.

1   40. (New) The system of claim 38 wherein the routing criteria includes routing cost.

1   41. (New) The system of claim 38 wherein the routing criteria includes routing distance.

1   42. (New) A system for decoding one or more repetitive data blocks in data

2   communicated over a network comprising:

3   a decoder module being coupled in the network, the decoder module receiving data

4   blocks for different communication sessions from a corresponding encoder module;

5   and

6   a memory accessible to the decoder module for storing the contents of one or more data

7   blocks previously received from the corresponding encoder module wherein the

8   decoder module determines whether the contents of each of the received data blocks

9   is in encoded form,

10   wherein responsive to the respective data block being in encoded form, the decoder

11   module selects the contents of a matching previously received block as the contents

12   for the respective encoded block, and responsive to the data block being unencoded,

13   the decoder module stores the contents of the respective received data block as a

14   previously received data block.

1   43. (New) The system of claim 42 wherein the decoder module is coupled via a switch

2   in a physical connection between two nodes of the network, responsive to a first configuration of

3   the switch, the encoder module processing data that traverse the physical connection between

10

4   these two nodes, and responsive to a second configuration of the switch, the data bypassing the

5   decoder module.

1   44. (New) The system of claim 42 wherein the decoder module operates in a node in the

2   network and decides a route for a decoded data block to its destination address.

1   45. (New) The system of claim 42 wherein the decoder module receives an indicator for

2   identifying that the contents of at least one encoded data block have been previously transmitted

3   to the decoder module.

1   46. (New) The system of claim 45 wherein the indicator is a special symbol.

1   47. (New) The system of claim 45 wherein the indicator is an extra header.

1   48. (New) The system of claim 42 wherein at least one encoded data block is a packet

2   payload.

1   49. (New) The system of claim 42 wherein at least one encoded data block is a portion

2   of a packet payload.

1   50. (New) The system of claim 42 wherein the decoder module decodes at least one

2   encoded data block using a synchronization mechanism for verifying the identification of the one

3   or more previously received data blocks from a corresponding encoder module.

1   51. (New) The system of claim 50 wherein the synchronization mechanism is an explicit

2   synchronization mechanism.

1   52. (New) The system of claim 50 wherein the synchronization mechanism is an

2   implicit synchronization mechanism.

1   53. (New) The system of claim 52 wherein the implicit synchronization mechanism is a

2   reliable network transport protocol.

1   54. (New) The system of claim 50 wherein the synchronization mechanism is a reliable

2 network transport protocol.

1   55. (New) The system of claim 42 wherein responsive to the data block being

2 unencoded, the decoder module stores the contents of the respective received data block as a

3 previously received data block further comprises determining whether to delete at least one of

4 the previously received data blocks.

1   56. (New) The system of claim 42 wherein the memory stores the previously received

2 data blocks in a least recently used data structure for storing one or more previously received

3 unique data blocks, the least recently used data structure having a maximum capacity and each of

4 the previously received unique data blocks having a unique identifier and a position in an order

5 of most recently used to least recently used of the one or more previously received blocks.

1   57. (New) The system of claim 56 wherein the decoder module, responsive to a match

2 in contents, associates the previously received data block having the matching contents with the

3 position in the least recently used data structure indicating the most recently used previously

4 received data block.

1   58. (New) The system of claim 56 wherein the decoder module, responsive to no match

2 in contents between the respective received data block and any one of the previously received

3 data blocks, stores the respective received data block in the least recently used data structure, and

4 associates the position of most recently used with the respective received data block.

1   59. (New) The system of claim 58 further comprising: responsive to the least recently

2 used data structure being at the maximum capacity, storing the respective received data block in

3 the least recently used data structure comprises replacing the previously received data block

4   having the order position of least recently used data block with the respective received data

5   block.

1   60. (New) The system of claim 56 further comprising a synchronization mechanism

2   including a same size for the least recently used data structure as the size of a second least

3   recently used data structure accessible by the corresponding encoder module that transmitted the

4   respective received data block, and a reliable network transport protocol being used for the

5   transmission of the respective received data block.

1   61. (New) The system of claim 56 further comprising a synchronization mechanism

2   including a same size for the least recently used data structure as the size of a second least

3   recently used data structure accessible by the corresponding encoder module, an indicator for

4   each received data block indicating whether the received data block has been previously

5   associated with the second least recently used data structure, and an installation

6   acknowledgement transmitting by the decoder module to the corresponding encoder module

7   responsive to an installation of each received block in the least recently used data structure.

1   62. (New) The system of claim 56 further comprising a synchronization mechanism

2   wherein the decoder module receives a version number of the previously received data block

3   having the matching contents, the version number indicating how many times the identifier for

4   this data block has been re-used.

1   63. (New) The system of claim 42 wherein the system further comprises a decapsulation

2   module for decapsulating a block of data received over the network from a source address

3   supported by a corresponding encoder module.

1   64. (New) The system of claim 63 wherein the received data block is included in a

2   packet, and the packet has been decapsulated as one packet.

1   65. (New) The system of claim 63 wherein the received data block is included in a

2 packet and the packet has been decapsulated with at least one other packet in an outgoing packet

3 transmitted from a source address supported by a corresponding encoder module.

1   66. (New) The system of claim 63 wherein the decapsulation module decapsulates the

2 received block of data at a first layer of a model describing the flow of data across a network and

3 the decoder module decodes the received block of data at a second layer of the model.

1   67. (New) The system of claim 66 wherein the first layer and the second layer are the

2 same layer.

1   68. (New) The system of claim 66 wherein one of the layers is a connection-oriented

2 layer and the other layer is a connectionless layer.

1   69. (New) The system of claim 42 wherein the decoder module transmits routing

2 information for identifying one or more addresses it supports over the network to the

3 corresponding encoder module.

1   70. (New) The system of claim 69 wherein the decoder module participates in routing

2 protocols for obtaining routing information.

1   71. (New) A system for decreasing one or more repetitive data blocks in data

2 communicated over a network comprising:

3   an encoder module, coupled in the network, the encoder module intercepting the data, the

4   encoder module extracting data blocks from different communication sessions from

5   the intercepted data, each extracted block having a destination address supported for

6   decoding by at least one corresponding decoder module, and the encoder module

7   passing through data not having a supported destination address;

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8   a first memory, accessible to the encoder module, for storing the contents of one or more

9   data blocks previously transmitted by the encoder module wherein the encoder

10   module determines whether there is a match between the contents of each of the

11   extracted data blocks and the contents of at least one previously transmitted data

12   block,

13   wherein responsive to a match, the encoder module encodes the respective extracted data

14   block and transmits the respective extracted data block in encoded form to the at least

15   one corresponding decoder module, and responsive to no match, the encoder module

16   transmits the respective extracted data block in intercepted form to the at least one

17   corresponding decoder module;

18   the at least one corresponding decoder module being coupled in the network, the decoder

19   module receiving data blocks for different communication sessions from the encoder

20   module; and

21   a second memory accessible to the decoder module for storing the contents of one or

22   more data blocks previously received from the encoder module wherein the at least

23   one corresponding decoder module determines whether the contents of each of the

24   received data blocks is in encoded form,

25   wherein responsive to the respective data block being in encoded form, the decoder

26   module selects the contents of a matching previously received block as the contents

27   for the respective encoded block, and responsive to the data block being unencoded,

28   the decoder module stores the contents of the respective received data block as a

29   previously received data block.

1   72. (New) A method for encoding one or more repetitive data blocks in data

2   communicated over a network comprising:

3   intercepting the data;

4   extracting data blocks from different communication sessions from the intercepted data,

5   each extracted block having a destination address supported for decoding;

6   passing through data not having a supported destination address;

7   storing the contents of one or more data blocks previously transmitted;

8   determining whether there is a match between the contents of each of the extracted data

9   blocks and the contents of at least one previously transmitted data block;

10   responsive to a match, encoding the respective extracted data block, and transmitting the

11   respective extracted data block in encoded form to the at least one corresponding

12   decoder module; and

13   responsive to no match, the encoder module transmitting over the network the respective

14   extracted data block in intercepted form.

1   73. (New) The method of claim 72 further comprising responsive to a match in contents,

2   transmitting an indicator for identifying that the contents of a respective data block have been

3   previously transmitted.

1   74. (New) The method of claim 72 further comprising synchronizing the identification

2   of the one or more previously transmitted data blocks with at least one corresponding decoder

3   module supporting the destination address of the extracted data block.

1   75. (New) The method of claim 72 further comprising, responsive to no match between

2   the contents of the respective extracted data block and the contents of at least one of the

3   previously transmitted blocks, determining whether to delete at least one of the previously

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4   transmitted data blocks in the memory, and storing the respective extracted data block in

5   intercepted form in the memory.

1   76. (New) The method of claim 72 wherein storing the contents of one or more data

2   blocks previously transmitted comprises storing one or more previously transmitted unique data

3   blocks in a least recently used data structure, said least recently used data structure having a

4   maximum capacity and each of the previously transmitted unique data blocks having a unique

5   identifier and a position in an order of most recently used to least recently used of the one or

6   more stored blocks.

1   77. (New) The method of claim 76 further comprising, responsive to a match in

2   contents, associating the previously transmitted data block having the matching contents with the

3   position in the least recently used data structure indicating the most recently used previously

4   transmitted data block.

1   78. (New) The method of claim 76 further comprising, responsive to no match between

2   the contents of an extracted data block and the contents of one of the previously transmitted data

3   blocks, storing the extracted data block in the least recently used data structure, and associating

4   the position of most recently used with the extracted data block.

1   79. (New) The method of claim 78 further comprising:

2   responsive to the least recently used data structure being at the maximum capacity,

3   deleting the previously transmitted data block having the order position of least

4   recently used data block.

1   80. (New) The method of claim 79 further comprising encoding at least one data block

2   at a first layer of a model describing the flow of data across a network and the encapsulating the

3   at least one extracted data block at a second layer of the model.

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1   81. (New) The method of claim 80 wherein one of the layers is a connection-oriented

2   layer and the other layer is a connectionless layer.

1   82. (New) The method of claim 72 further comprising receiving routing information

2   over the network from each of one or more corresponding decoder modules; and

3   determining the one or more addresses supported by each respective decoder module

4   from the routing information.

1   83. (New) The method of claim 82 further comprising determining network topology

2   information based upon the routing information from the one or more decoder modules.

1   84. (New) The method of claim 83 further comprising responsive to multiple decoder

2   modules in the network supporting the same address, determining a destination decoder module

3   for one or more extracted data blocks based upon network topology information and routing

4   criteria.

1   85. (New) A method for decoding one or more repetitive data blocks in data

2   communicated over a network comprising:

3   receiving data blocks for different communication sessions from a corresponding encoder

4   module;

5   storing the contents of one or more data blocks previously received from the

6   corresponding encoder module;

7   determining whether the contents of each of the received data blocks is in encoded form;

8   responsive to the respective data block being in encoded form, selecting the contents of a

9   matching previously received block as the contents for the respective encoded block; and

10   responsive to the data block being unencoded, storing the contents of the respective

11   received data block as a previously received data block.

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1   86. (New) The method of claim 85 further comprising receiving an indicator for

2 identifying that the contents of at least one encoded data block have been previously transmitted

3 to the decoder module.

1   87. (New) The method of claim 85 further comprising the identification of the one or

2 more previously received data blocks from a corresponding encoder module.

1   88. (New) The method of claim 85 further comprising responsive to the data block

2 being unencoded, storing the contents of the respective received data block as a previously

3 received data block further comprises determining whether to delete at least one of the

4 previously received data blocks.

1   89. (New) The method of claim 85 wherein storing the previously received data blocks

2 further comprises storing one or more previously received unique data blocks in a least recently

3 used data structure, the least recently used data structure having a maximum capacity and each of

4 the previously received unique data blocks having a unique identifier and a position in an order

5 of most recently used to least recently used of the one or more previously received blocks.

1   90. (New) The method of claim 89 further comprising responsive to a match in contents,

2 associates the previously received data block having the matching contents with the position in

3 the least recently used data structure indicating the most recently used previously received data

4 block.

1   91. (New) The method of claim 89 further comprising responsive to no match in

2 contents between the respective received data block and any one of the previously received data

3 blocks, storing the respective received data block in the least recently used data structure, and

4 associating the position of most recently used with the respective received data block.

1   92. (New) The method of claim 91 further comprising: responsive to the least recently

2   used data structure being at the maximum capacity, deleting the previously received data block

3   having the order position of least recently used data block.

1   93. (New) The method of claim 85 further comprising decapsulating the received block

2   of data at a first layer of a model describing the flow of data across a network and decoding the

3   received block of data at a second layer of the model.

1   94. (New) The method of claim 93 wherein the first layer and the second layer are the

2   same layer.

1   95. (New) The method of claim 94 wherein one of the layers is a connection-oriented

2   layer and the other layer is a connectionless layer.

1   96. (New) The method of claim 85 further comprising transmitting routing information

2   for identifying one or more addresses it supports over the network to the corresponding encoder

3   module.